

REMARKS/ARGUMENTS

The claims are 4-7 and 9-21. Claim 13 has been amended to improve its form. Reconsideration is expressly requested.

Claim 13 was objected to as reciting "the wire" in lines 2 and 3 instead of -- the welding wire --. In response, Applicant has amended claim 13 to improve its form, which it is respectfully submitted overcomes the Examiner's objection on this basis.

Claims 4-7 and 9-21 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Steele U.S. Patent No. 2,906,859* in view of *Ogilvie et al. U.S. Patent No. 4,758,707*.

Essentially the Examiner's position was (1) that *Steele* discloses the claimed method, except for the welding parameters being controlled in a manner that no or only little welding wire material melting is effected and except for the base current phase condition set forth in claim 14, (2) that the melting controlling condition and the base current phase condition are

well known in the art as shown by *Ogilvie et al.*, and (3) that it would have been obvious to one of ordinary skill in the art to perform the method of *Steele* under the conditions of *Ogilvie et al.* of controlling melting and using a base current phase.

This rejection is respectfully traversed.

As set forth in claim 21, Applicant's invention provides a method for controlling a welding process using a melting welding wire and a welding torch wherein at least one mechanical adjustment process is carried out during the welding to determine the position of the welding wire using the welding wire as a sensor. During the at least one mechanical adjustment process, the welding torch is maintained in position and the welding parameters are controlled in a manner that no or only little welding wire material melting is effected and contacting of the welding wire with a workpiece is effected by moving the welding wire towards the workpiece. After contacting of the welding wire with the workpiece, the welding wire is moved away from the workpiece to a fixedly pre-given or adjustable distance relative to the workpiece.

The primary reference to *Steele* discloses a method and an apparatus for electric arc welding using a non-melting electrode 12. As described in *Steele*, the electrode 12 is tightly gripped in the electrode holder 13 which in turn is raised and lowered by appropriate gears such as the rack 14 and the engaging pinion 16 which acts to raise and lower the entire electrode holder and thus the electrode 12 with respect to the work. See column 3, lines 13-19 of *Steele*. FIG. 2 of *Steele* shows another embodiment with a consuming wire electrode 12' whereby an adjustment of the distance of the electrode's tip and the workpiece is done with a worm-wheel 18 and a shaft 17.

The arc length or the length between the tip of the electrode 12, 12' and the workpiece is adjusted via the arc voltage as described in column 5, lines 22-53 of *Steele*. The passage in column 8, lines 26-64 of *Steele* describes an ignition method whereby the electrode 12 touches the workpiece and is retracted when energizing an arc starter solenoid 31 to establish an arc gap. It is respectfully submitted that *Steele* fails to disclose or suggest a mechanical adjustment process which is carried out during a welding process whereby the welding wire is

moved forward to the workpiece until contacting of the welding wire with the workpiece is effected, whereby the welding parameters are controlled in a manner that with no or only little welding wire material melting is effected, wherein after the contact of the welding wire with the workpiece, the welding wire is moved away from the workpiece to a fixedly pre-given distance relative to the workpiece, and wherein after the mechanical adjustment process the normal welding process is continued.

It is respectfully submitted that *Steele* fails to disclose or suggest a mechanical adjustment process as recited in Applicant's claim 21 and fails to disclose or suggest the moving of a welding wire back from the workpiece to a fixedly pre-given distance relative to the workpiece. The welding apparatus according to *Steele* enables only the movement of the welding wire in the direction towards the workpiece and not back during the normal welding process (with the exception of the ignition of the welding arc). In contrast, the mechanical adjustment process as set forth in Applicant's claim 21 differs from the contact ignition method as described in *Steele*. The mechanical adjustment process as recited in Applicant's claim 21 is carried

out during the welding process, for instance between two pulse current phases 35 during pulse welding, as can be seen in FIGS. 2-5 of Applicant's disclosure. The mechanical adjustment process 41 is performed in the base current phase 35, whereby it is ensured that no droplet 38 will form on the end of the welding wire 13 and hence no or only little melting of material or material transfer onto the workpiece 16 will occur. The method according to Applicant's claim 21 enables the control of the length of the arc during the welding process.

The defects and deficiencies of the primary reference to Steele are nowhere remedied by the secondary reference to Ogilvie et al., which simply describes a pulsed arc welding method without mentioning a mechanical adjustment process as recited in Applicant's claim 21.

Accordingly, it is respectfully submitted that claim 21, together with claims 4-7 and 9-20 which depend directly or indirectly thereon, are patentable over the cited references.

In summary, claim 13 has been amended. In view of the foregoing, withdrawal of the final action and allowance of this application are respectfully requested.

Respectfully submitted,
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